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Eloge of Daniel McFadden by André de Palma for the Honoris  
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# Presentation of Daniel McFadden,

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On behalf of all of us, I would like to warmly thank Daniel McFadden for having travelled all the way from the US to take part in this Honoris Causa ceremony. Many of his friends and researchers in the field are here and they all join me to express their appreciation.

We have been fortunate, because it is not the first time Dan comes to the University of Cergy-Pontoise. In the last millennium, he visited us on several occasions, in particular to exchange ideas with Yurii Nesterov and myself on various optimization problems in large-scale systems. During this century, Dan came to Cergy to discuss other topics, including some related to the economics of the family. He was also a member of Nathalie Picard's "HDR".

His presence today is obviously an honor. Not surprisingly, it is also a pleasure and that pleasure will extend beyond the ceremony because we will enjoy one of the few things that, in these days and age, cannot, in any way, be conveyed remotely: the French cuisine. Against all odds; in spite of robots and automatization; it continues to have a *material* life and no virtual substitutes.

I would also like to thank the University of Cergy-Pontoise, my former employer for organizing this event, although it subjected me to a constraint that made me hesitate to take the floor: I was only granted a few minutes to summarize in a few minutes the vertiginous career of Daniel McFadden. It is "mission: impossible" but, perhaps because of my name, I decided to accept the challenge.

Daniel is one of the few scholars who never had much tolerance for the concept of disciplinary frontiers; he has combined with exceptional skills disciplines as diverse as economic theory, econometrics, operational research (when he introduced the notion of duality in micro-economics), behavioral science, psychology and psychophysics.

But I should be more systematic or I will never complete my *impossible mission*....

1. Should I speak about his Nobel Prize in Economics, received with James Heckman at the turn of last millennium "*for his development of theory and methods for analyzing discrete choice*"? Dan spent his life analyzing the behavioral patterns in individual decision-making. He had a major impact not only on Transportation science, but also in the New Industrial organization, Regional Science, Finance, Demography, Social Sciences, not forgetting Marketing. The list is opened and it is impossible to be exhaustive: Impacts are everywhere.
2. Should I speak about his early study of physics? Let me drop that one: Having myself studied physics in my young days, I would probably be too long!
3. Should I speak about his early career at the University of Minnesota, then at MIT, at the University of California - Berkeley or at the University of Southern California?
4. Should I speak about the frontiers he pushed on the steps of great pioneers such as Thurstone, Marschak, Luce, Tversky or Kahneman?
5. Should I speak about how he triggered a revolution by bringing simple theories to a very mature stage: from the Logit to the Nested Logit, from the Nested Logit to the mixed Logit (and, more recently, to the double mixed Logit), to the cross-nested and to other hybrid models? Daniel McFadden, as Werner Heisenberg, has developed a new reasoning on things that can be observed and also on things that cannot be observable, but can, nevertheless, be modelled.

Let me rather focus on the analysis of decision-making. Dan has revolutionized the profession by providing it with an economic foundation. Never short of ideas, and while he was at it, he also gave it new econometric, computational and operational dimensions. Even more impressive, he managed to make individual discrete choice models acceptable not only to consultants, but also to policy makers and to academics: a real 'tour de force'. The discrete choice models developed by Dan are now known and used all over the world, be it by academics, including here at Thema or Essec, or by practitioners, such as at Nielsen.

Dan wrote just a few hundred articles in various fields including Mathematical Economics, Transportation, Production theory, Environmental Economics and

Health Economics. And many more .... One of Dan's specialties is to publish seminal articles that soon become highly quoted and appear in top Journals. But he also publishes in more in confidential places. In all cases, his name is an undisputable label of quality. "Qu'importe le verre, pourvu qu'on ait l'ivresse."

I should stop this list here since today, almost everything can easily be discovered on the web (except French Cuisine, but I believe that I already mentioned that). A good teacher should ideally assume the audience knows what is posted on the web, and go one step further. Repeating Wikipedia or Youtube is not a solution: it is the problem. We, teachers, have to go beyond. Should we deliver understanding rather than memorization? Understanding is not the same as being able to regurgitate. This is an area where a new model is really needed. And trust Dan to have thought about it: indeed, he has already provided us with useful hints in this direction.

The printing revolution made accessible in books, knowledge that had to be memorized before: « Il vaut mieux une tête bien faite qu'une tête bien pleine », as Michel de Montaigne used to say. After the printing revolution, it was enough to know where the relevant books could be located on the shelves of the library (which is easier than having to memorize their contents!).

A second revolution is taking place, a silent one: most of us fear it and fail to understand it. Nowadays, everybody can have access to almost all culture instantaneously, and electronic chips have more memory than human brains. This numeric revolution is nicely explained to the skeptical generation by the French philosopher Michel Serres in a short book *La petite Poucette*, on those writring with thumbs (on smart phones) and having access via Internet to all libraries everywhere.

Automation and the digital economy may change everything in the study of individual decision-making: it involves decentralization of knowledge and of reasoning.

Some scholars, as Stephan Hawking, fear artificial intelligence and automates. For many, robots and collective intelligence are dangerous artificial devices that could dangerously become substitutes for human decisions. We should relax and consider that automation is an intrinsic property of life. Let me take a step in natural sciences (perhaps an area where Dan has not been so present) and consider that the behavior of antelopes interpreting soaring birds is and should be an automatic mechanism: any delay would be fatal.

Is the work of Dan on individual (human) decision-making becoming obsolete, being superseded by the irreversible spring of artificial intelligence?

I will answer this question with one example. High frequency trading consists in automata: it reacts at high speed to information and can make 250 transactions in the blink of an eye. How can humans compete with this? One could perhaps be fearful: fast trading has been dangerously unstable as when a bug occurs, the system may buy stocks and be trapped in a positive feedback loop.

Observers infer information from the action of other robots. If an error occurs, an almost instantaneous snow ball effect may blow the system up. Even a former President of the Federal Reserve, Alan Greenspan, admitted that fast trading was dangerous.

To express these thoughts on the matter, I believe that we are in need of a new terminology and, as a welcome gift to our guest, I propose a motto: “Sustainable fast trading”.

My belief is that our scope should be that the **Man remains in control of the decision process**. The sensible decision is not a local one -buy or not to buy a stock, but a global one (understand macroscopic consequences). The question is how we should add feedback loops involving human judgment and reasoning, in a system where some (or most) decisions are delegated to robots. Human have colonized the earth, one day they will colonize Mars, perhaps the rest of the universe. As far as the Earth is concerned, it is also important to construct control to colonize and not be colonized, by artificial intelligence. Decision-making is more alive than ever, but it faces new challenges. The pioneer work of Dan in that area should be developed further by him – of course – and by others.

Young generations face new challenges. They will benefit, I hope, from the directions opened by Dan. Some of these directions will be explored at the seminar on “Advances in Discrete Choice Models”, organized in his honor. In particular, theoretical and empirical models, should integrate a component reflecting human common sense, to put bounds on an otherwise dangerous fully automatic set of loops.

Finally, and as our session of French cuisine is fast approaching, I must tell you that, in the 2006 issue of the Journal of Wine economics, Dan speaks about Wine Shipment and E-Commerce. He also spoke, in his Nobel lecture on “road in wine production” to illustrate cognitive biases. Let me reveal a secret: Dan is

a true wine connoisseur. Let me add another: He is himself involved in wine production at a very professional level.

Friendship between US and France is not new, including in wine production.

Thank you, Dan, for coming to visit us and exchange ideas about the coming world.

André de Palma

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